

(19)



Europäisches Patentamt

European Patent Office

Office européen des brevets

(11)



EP 0 869 447 A1

(12)

## EUROPEAN PATENT APPLICATION

(43) Date of publication:  
07.10.1998 Bulletin 1998/41

(51) Int Cl. 6: G06F 17/30

(21) Application number: 98302228.6

(22) Date of filing: 24.03.1998

(84) Designated Contracting States:  
AT BE CH DE DK ES FI FR GB GR IE IT LI LU MC  
NL PT SE  
Designated Extension States:  
AL LT LV MK RO SI

(30) Priority: 31.03.1997 US 828992

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### (54) Device with combined Internet and TV/Video functionality

(57) A electronic convergence device system comprising a computer for generating indications of a first mode of operation and for generating indications of a second mode of operation, and an output device cou-

pled to the computer to receive the indications of the first and second modes of operation, which output device is provided for at least alternately outputting the indications of the first and second modes of operation, based on a user/viewer selection.

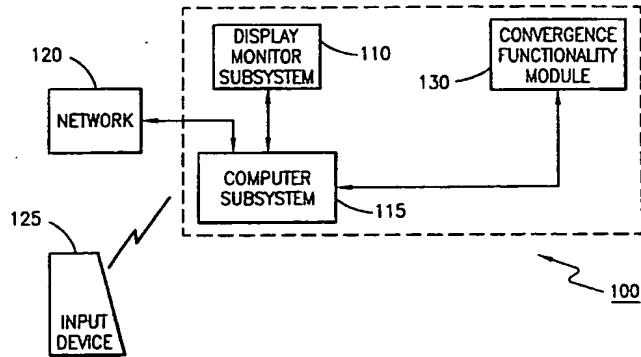


FIG. 1

## Description

The present invention relates to devices with integrated multiple functional modalities, and in particular, to convergence device systems having integrated computer and consumer/home electronics functionalities.

Achieving convergence of various information, entertainment and communications technologies has become a much sought-after goal. A highly visible example of this trend is the attempt to integrate computer technologies (such as, for example, personal computer technologies) with consumer/home electronics technologies (such as, for example, television technologies, video game technologies, video telephony, video/laser disc technologies, et cetera). It is hoped that one of the products of this convergence would be a single integrated device for information, entertainment and communications, which device can, at least in part, utilize the available communications bandwidth, mass storage and graphics handling capabilities of the personal computer (PC) to deliver, store and display a variety of applications so as to provide a seamlessly unified audio-visual environment to consumers.

In spite of many recent advances in this area, several problems persist. One of the more significant difficulties relates to providing a user/viewer effective content control and engaging interactivity, preferably all in one machine, with selectable modes of "functionalities" that essentially appertain to experiences associated with different discrete entities, for example, a PC or a TV or a video/laser disc unit et cetera, such that the viewer can seamlessly make a transition from one functionality to another. Further, it can be appreciated that by providing a functionality that is as close as possible to a discrete unit in terms of the viewer's experience thereof, the convergence aspect of the machine is greatly enhanced. Such enhanced convergence may be necessary or desirable in relation to increasing the "appeal" and feature-set of the integrated device.

Current developments in this area fall into two broad categories. One category relates to conventional TV sets with access to the Internet or the World-wide Web. The other category relates to PCS with a limited TV functionality. Neither of these categories provide a "fully-converged" system wherein the viewer can seamlessly select from a broad "menu" of experiences, each of which comprises a functionality that is substantially identical to one offered by an individual discrete unit. Current TV sets with Web access do not offer the full range of PC functionality. On the other hand, current PCS operable with TV signals provide only a limited TV experience in that a TV application is typically displayed as a window on the PC desktop presented on the same monitor associated with the PC. Typically, the viewer does not experience in these systems a TV viewing environment that is identical to a conventional TV with over-scanned display images having enhanced brightness, sharpness, contrast and color temperatures, en-

hanced Red-Green-Blue (RGB) amplifier gains et cetera.

Accordingly, based upon the foregoing, it should be understood and appreciated that there is a need for a system that is more completely converged than is currently known or possible in order to provide a user/viewer with a seamless environment for education, entertainment, communications and information. Although systems such as TVS with Web access and PCS with TV in a window described above have been extant for sometime, no current system is known to have all of the advantages and novel features of the system described and claimed hereinbelow.

## 15 SUMMARY OF THE INVENTION

In one aspect, the present invention is drawn to an electronic convergence device comprising a computer for generating indications of a first mode of operation and for generating indications of a second mode of operation; and an output device coupled to the computer to receive the indications of the first mode of operation and to receive the indications of the second mode of operation, wherein the output device is provided for at least alternately outputting the indications of the first mode of operation and the indications of the second mode of operation.

In another aspect, the present invention relates to a system operable to provide computer functions and operable to provide convergence functions, which system comprises

a convergence functionality device for generating convergence function signals; a computer coupled to the convergence functionality device to receive the convergence function signals, the computer for generating computer function signals; and a display device coupled to the computer to receive the computer function signals and the convergence function signals, the display device being operable to at least alternately display the computer function signals in a manner which appear to a user to be the computer functions and to display the convergence functions signals in a manner which appear to the user to be the convergence functions.

In a yet another aspect, the present invention is drawn to a method of operation for an electronic convergence device, which method comprises the steps of: generating indications of a first mode of operation; generating indications of a second mode of operation; and outputting, in at least a user selectable alternate manner, the indications of the first mode of operation and the indications of the second mode of operation.

A more complete understanding of the present invention may be had by reference to the following detailed description when taken in conjunction with the accompanying drawings wherein:

FIG. 1 illustrates an exemplary convergence device system provided in accordance with the teachings

of the present invention;

FIG. 2 depicts a block diagram of a high-level architectural scheme for use with an exemplary convergence device system provided in accordance with the teachings of the present invention; and FIG. 3 depicts a state diagram for modal transitions in an exemplary convergence device system provided in accordance with the teachings of the present invention.

Referring now to the Drawings wherein like or similar elements are designated with identical reference numerals throughout the several views, and wherein the various elements depicted are not necessarily drawn to scale, and, in particular, to FIG. 1, there is shown a block diagram of an exemplary convergence device system (or, an electronic convergence device) 100 provided in accordance with the teachings of the present invention. This block diagram is not necessarily intended to schematically represent specific modules of hardware or any particular data or control paths therebetween.

The convergence device system 100 includes a first subsystem, display monitor subsystem 110, operable to receive and display thereon display signals (or, indications thereof) received from a second subsystem, computer subsystem 115. Although not depicted, the subsystem 115 comprises a processor unit coupled to a storage unit, and may further preferably contain a communication port for enabling communication between the convergence device system 100 and a network 120.

Continuing to refer to FIG. 1, the network 120 can be understood to be any network, for example, a Local Area Network, a Metropolitan Area Network, a Wide Area Network, or the Internet. The computer subsystem 115 is connected to a convergence functionality module 130 that is adapted to receive and/or provide various combinations of composite and/or RF and/or video and/or audio and/or graphics and/or data signals. For example, the module 130 may comprise a receiver for receiving TV signals in any form, such as the National Television Standards Committee (NTSC) form or the Phase Alternate Line (PAL) form, via any medium, digital or analog, such as the cable system, the Digital Satellite System, or a network broadcast medium. In another embodiment, the module 130 may comprise a consumer/home electronics unit adapted to be integrated with the computer subsystem 115. For example, a video gaming unit or a video disc unit may be provided such that the outputs (video, audio, or both) of the units are controlled or modulated by the computer subsystem 115. A video controller service in the subsystem 115 may be responsible for managing these outputs such that appropriately modulated (or decoded or processed) display signals (or, indications thereof) are selected to be forwarded to drive suitable output devices, for example, the display monitor subsystem 110 or an audio output device (not shown).

Although the module 130 and the subsystem 115

are shown to be two separate yet interconnected entities, the module 130 may in some embodiments of the present invention be integrated into the subsystem 115. Such an integrated subsystem may comprise in a single

5 housing one or more video sources (or consumer/home electronics units including receivers for TV signals, gaming units, VCRs, video/laser disc units, video telephony units etc.), the video control service for managing and selecting among these sources and for generating appropriate display signals (or, indications thereof) to be provided to suitable output devices, and the processor and storage units. Still continuing to refer to FIG. 1, the convergence device system 100 may be operable with an input device 125 which may comprise any of the 10 following: remote control units, remote track-ball/mouse devices, remote pointing devices, wireless or wired keyboards, keyboards integrated with pointing devices, track-balls and the like. Further, although not shown in this FIG., it should also be understood that the convergence device system 100 may contain such hardware modules as a power unit for supplying power thereto, TV tuner boards, CD-ROM players, floppy drives, printer ports, video ports et cetera.

Referring now to FIG. 2, there is shown a block diagram of a high-level architectural scheme 200 for use with the exemplary convergence device system 100. At the lowest level is one or more hardware abstraction layers (HALs) 220 which preferably handle direct hardware interfaces coupled to various hardware entities such as 15 remote devices, keyboards, TV decoders, video decoders, display controllers, audio mixers, compact disc drives et cetera. Preferably, the hardware abstraction layer 220 can completely hide the specifics of implementation of different hardware modules as long as they 20 perform the same function. Immediately above the HAL 220 is a service provider layer 215 which interfaces to the HAL 220 by a defined mechanism. This defined mechanism, in some instances, may be a widely accepted suitable standard that is specific to the type of an application in use. The service provider layer 215 exports an application-specific Application Programming Interface (API) for an applications layer 210 to use. It is 25 presently preferred that the API be a standard interface. It should be understood that as new functions are added, a new standard API may have to be developed for implementing such a new function in the convergence device system of the present invention.

Continuing to refer to FIG. 2, the application layer 210 handles, at least in part, one or more direct user 30 interfaces for the user to control a feature-set that may be provided with the convergence device system 100. A communications layer 205 is provided in the scheme 200 for facilitating information and data exchange between the applications. It can be appreciated by those 35 skilled in the art that the architectural scheme 200 is flexible and extensible so as to support a variety of software and hardware modules, additional services and functionalities necessary for achieving such a degree of con-

vergence as contemplated within the ambit of the present invention.

An Operating System (OS), for example, Windows 95®, associated with the convergence device system 100 may preferably be provided with a plurality of selectable items on the base level of its start menu such as, for example, the following: Programs, Documents, Settings, Find, Help, Run, Mode\_Select, Setup, Video Entertainment Center (VEC) or Video Center Service Applications and/or Bundled Applications. Access to these items may be facilitated via a START or MENU button that may be preferably located on a remote control unit operable with the system 100.

The Mode\_Select item is provided, at least in part, for facilitating a selection by user for experiencing and/or operating and/or interacting with one of the converged functionalities (or, modalities) presently supported by the system 100. FIG. 3 depicts a state diagram for modal transitions in the exemplary convergence device system 100 provided in accordance with the teachings of the present invention. In a presently preferred exemplary embodiment, a first mode of functionality is referred to as a "computer" mode 320 wherein the system 100 is preferably experienced by the user as a Personal Computer with a complete "look and feel" thereof. In this mode, the display monitor associated with the system 100 preferably possesses the following characteristics: underscan of the display image, disabled velocity scan modulation, a pre-determined "low" value associated with contrast, brightness and color temperature settings et cetera.

In accordance with the teachings of the present invention, a second mode of functionality and/or viewer experience, referred to as a "non-computer" mode 310, is provided for the system 100. It is preferably provided in this mode that the user experience is substantially identical to that of a functionality and look/feel offered by a discrete unit such as, for example, a TV 325, a Digital Versatile Disc or Compact Disc source 330, a VCR/Laser source 335, or any other external video source 340 currently known or to be developed in the future.

Continuing to refer to FIG. 3, the Video Entertainment Center or Video Control Service 345 is shared by both modes 310 and 320 for operating and/or managing and/or accessing the various discrete units described above. When the system 100 makes a transition from a "no power" state 305, it enters initially state 320. Immediately thereafter, the system 100 progresses to the functionality associated with state 310, mediated by the VEC/VCCS 345. Functionally or experience-wise, therefore, the system 100 is seen to make a transparent transition to state 310 from the "no power" state 305, which transition is shown as a unidirectional "dotted line" 399 in this FIG. Further, as can be seen, transition from state 310 to state 320 may be preferably mediated via an access control mechanism 315 operable in conjunction with the VEC/VCCS 345. It should be understood that access control mechanisms may range from simple

passwords to various advanced encryption techniques.

In a presently preferred exemplary embodiment, while in state 310 (that is, operating in the non-computer mode), the user may opt to experience any of the following functionalities including, but not limited to: watching TV in full-screen in overscan image, activating and controlling a separate Picture-In-Picture (PIP) window, viewing an external video source (for example, VCR, laser Disc, gameplayer, external Digital Satellite System, external DVD etc.), swapping a PIP image, watching a Motion Picture Experts Group (MPEG) standard video clip, using an Electronic Program Guide, accessing and interacting with Hyper\_Text\_Mark-up\_Language (HTML) pages and/or accessing additional menued applications. Further, in this mode, the display monitor associated with the system 100 may preferably possess the following characteristics: overscan of the display image, enabled velocity scan modulation, a pre-determined "high" value associated with contrast, brightness and color temperature settings et cetera.

It is contemplated within the ambit of the present invention that a preferred exemplary modality relating to state 310 may be a "TV mode" wherein the user obtains an experience that is most nearly identical to that of a conventional TV. In addition to the features described above, the system 100 may preferably be provided with additional features to enhance this modal experience, such as, for example, enabling/disabling closed captioning, channel up/down, direct channel selection, control of display features - brightness, contrast and the like, control of audio, frame freezing, saving frozen frames to files et cetera.

Although not shown in FIG. 3, it should be understood that while in state 320 (that is, computer mode), it is possible for the user to experience a TV program in a PC window ("TV in a window") which preferably appears as a selectable item on a task bar associated with the PC desktop. This "TV in a window" is not the same as the "TV mode" as described hereinabove in relation to state 310. If the user selects the TV application from the task bar, the application will come up in a window which may be dynamically sized and placed on the desktop, just like a normal PC window. However, in a presently preferred exemplary embodiment of the present invention, a PIP would not be permitted in this experience, and display settings and characteristics associated with the non-computer mode would not be available. On the other hand, while engaged in "TV in a window" functionality, the user can switch to the "TV mode" by operating a button on the remote control unit, or by selecting the TV source item on the MENU bar.

Based on the foregoing description, it should be appreciated by those skilled in the art that the convergence device system provided in accordance with the teachings of the present invention overcomes the shortcomings and deficiencies of current technologies by fully converging the functionalities of various discrete units into an integrated device for multiple experiences, each

being selectable by the user. It should further be understood that whereas individual consumer/home electronics units are "hardware-optimized" for delivering a particular user experience, the present invention teaches a more versatile system that is selectively optimized for a "menu" of experiences presented to the user.

Although only certain embodiments of the present invention have been illustrated in the accompanying Drawings and described in the foregoing Detailed Description, it will be understood that the invention is not limited to the embodiments disclosed, but is capable of numerous rearrangements, modifications and substitutions without departing from the spirit of the invention as set forth and defined by the following claims.

### Claims

1. An electronic convergence device comprising:

a computer for generating indications of a first mode of operation and for generating indications of a second mode of operation; and an output device coupled to said computer to receive said indications of said first mode of operation and to receive said indications of said second mode of operation, said output device for at least alternately outputting said indications of said first mode of operation and said indications of said second mode of operation.

2. The device as recited in claim 1, wherein said indications of the first or the second mode include personal computer functionality.

3. The device as recited in claim 1 or in claim 2, wherein said indications of respectively the first or the second mode include video viewing functionality.

4. The device as recited in claim 1 or in claim 2, wherein said indications of respectively the first or the second mode include complete television viewing functionality.

5. The device as recited in any of claims 1 to 5, wherein said output device includes a display monitor.

6. A system operable to provide computer functions and operable to provide convergence functions, said system comprising:

a convergence functionality device for generating convergence function signals; a computer coupled to said convergence functionality device to receive said convergence function signals, and for generating computer function signals; and a display device coupled to said computer to

receive said computer function signals and said convergence function signals, said display device being operable to at least alternately display said computer function signals in a manner which appear to a user to be the computer functions and to display said convergence functions signals in a manner which appear to the user to be the convergence functions.

10 7. The system as recited in claim 6, wherein said display device is selectively operable in at least one of an underscan mode and an overscan mode.

15 8. The system as recited in claim 7, wherein said display device is operable in said underscan mode when displaying said computer function signals, and further wherein said display device is operable in said overscan mode when displaying said convergence functions signals.

20 9. The system as recited in claim 8, wherein said convergence functionality device includes a video apparatus for generating video signals.

25 10. The system as recited in claim 9, wherein said video apparatus includes a television tuner.

11. An electronic device comprising:

30 a convergence functionality device for at least generating indications of a convergence mode of operation;

35 a computer coupled to said convergence functionality device to receive said indications of the convergence mode of operation, and for at least generating indications of a computer mode of operation; and

40 a display device coupled to said computer for receiving said indications of the computer mode of operation and for receiving said indications of the convergence mode of operation, and at least alternately solely displaying said indications of the computer mode of operation and said indications of the convergence mode of operation.

45 12. The electronic device as recited in claim 11, wherein said display device is selectively operable in at least one of an underscan mode and an overscan mode.

50 13. The electronic device as recited in claim 12, wherein said display device is operable in said underscan mode when displaying said indications of the computer mode, and further wherein said display device is operable in said overscan mode when displaying said indications of said convergence mode.

55 14. A method of operation for an electronic conver-

gence device, said method comprising the steps of:

generating indications of a first mode of operation;  
generating indications of a second mode of operation; and  
outputting, in at least a user selectable alternate manner, the indications of the first mode of operation and the indications of the second mode of operation.

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15. The method as recited in claim 14, wherein the step of generating indications of a first mode of operation is performed with a computer.

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16. The method as recited in claim 15, wherein said outputting step includes the step of displaying on a display monitor the indications of the first mode of operation.

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17. The method as recited in claim 16, wherein said outputting step includes the step of displaying on the display monitor the indications of the second mode of operation.

25

18. The method as recited in claim 15, wherein said outputting step includes the step of displaying on a display monitor in an underscan mode, the indications of the first mode of operation and displaying on the display monitor in an overscan mode, the indications of the second mode of operation.

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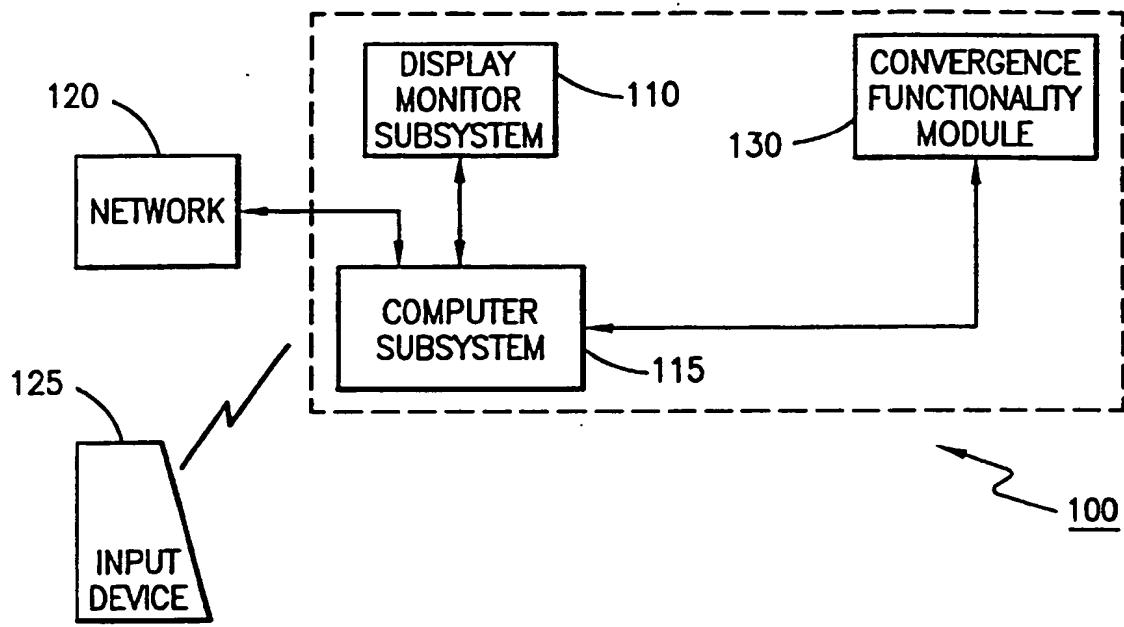
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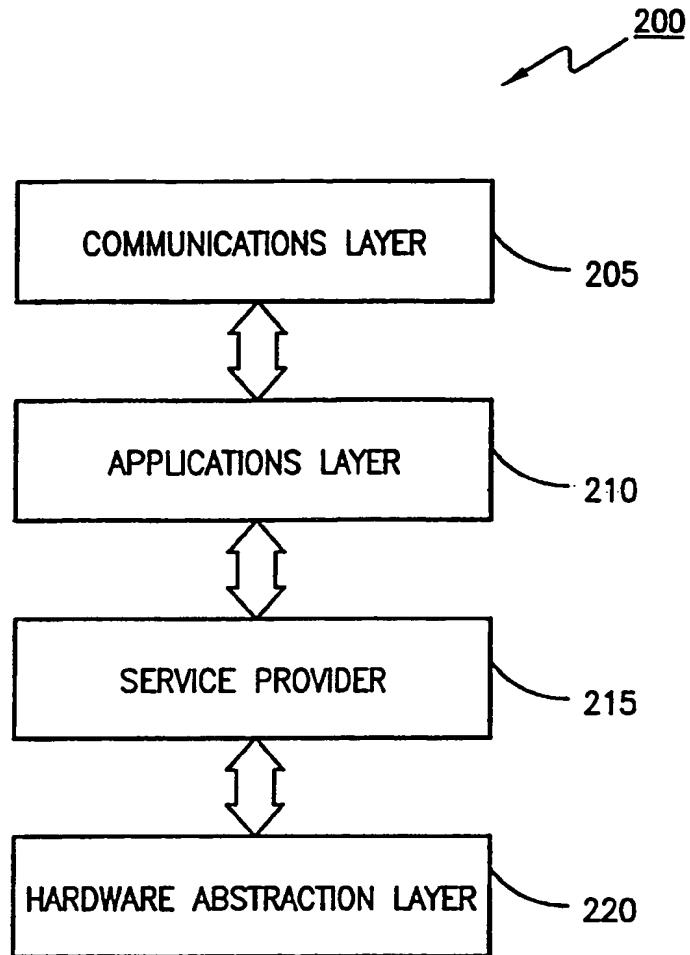
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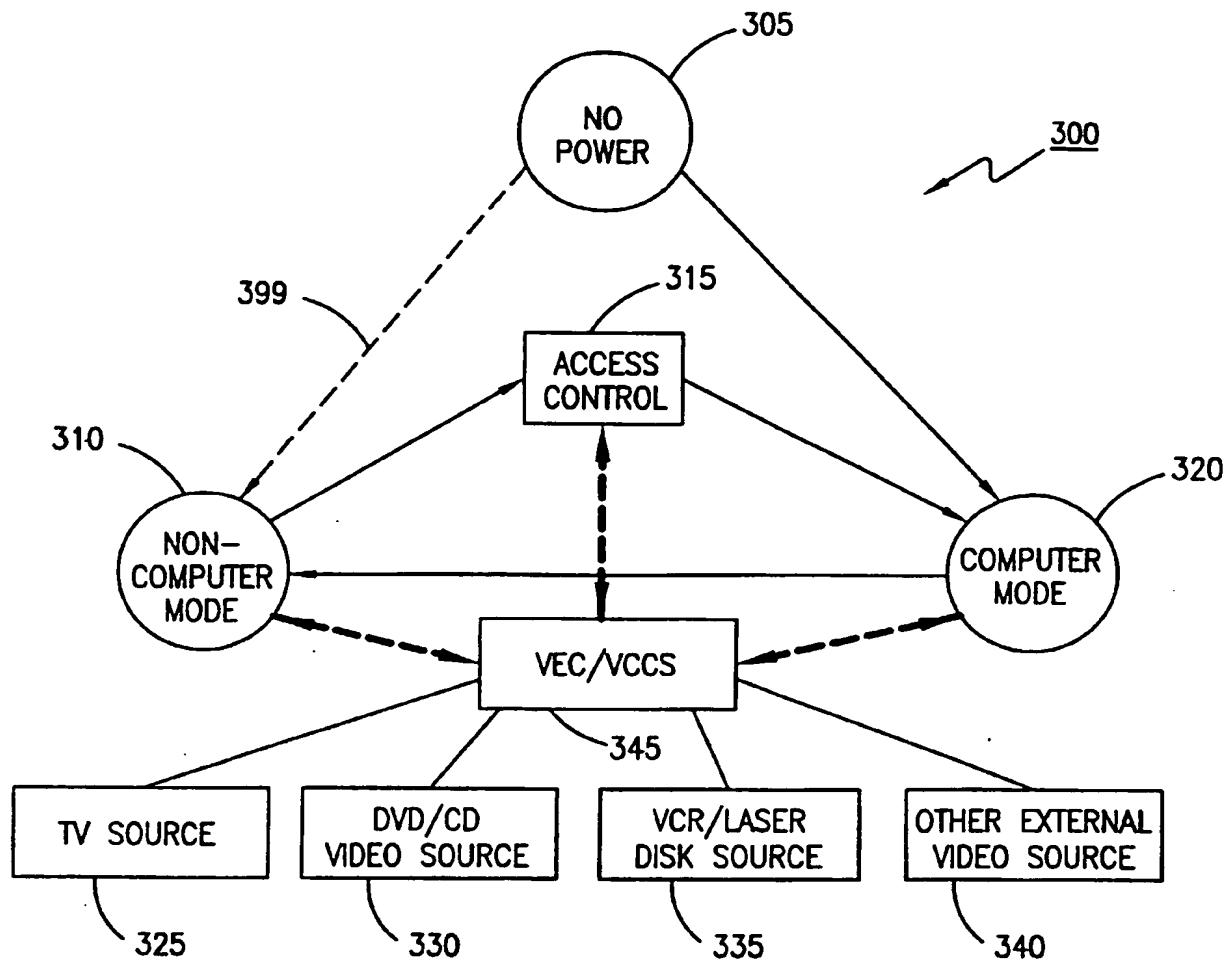
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***FIG. 1***



***FIG. 2***

**FIG. 3**



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## EUROPEAN SEARCH REPORT

Application Number  
EP 98 30 2228

DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int.Cl.6)		
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim			
P, X	WO 97 31476 A (R. M. PERKES) 28 August 1997 * the whole document * ---	1-18	G06F17/30		
A	EP 0 760 568 A (INTERNATIONAL COMPUTERS LIMITED) 5 March 1997 * the whole document * ---	1-18			
A	H. SCHULZRINNE: "World Wide Web: Whence, Whither, What Next?" IEEE NETWORK, vol. 10, no. 2, March 1996 - April 1996, NEW YORK, US, pages 10-17, XP000580078 * page 16, left-hand column, last paragraph - right-hand column, paragraph 3 * ---	1-18			
P, A	WO 97 28499 A (AWARD SOFTWARE INTERNATIONAL, INC.) 7 August 1997 * the whole document * -----	1-18	<div style="border: 1px solid black; padding: 2px;">TECHNICAL FIELDS SEARCHED (Int.Cl.6)</div> <div style="border: 1px solid black; padding: 2px;">G06F</div>		
The present search report has been drawn up for all claims					
Place of search	Date of completion of the search	Examiner			
BERLIN	13 May 1998	Abram, R			
CATEGORY OF CITED DOCUMENTS					
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document					
T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document					